

WHAT WE CLAIM IS:

1. An isolated nucleic acid molecule having a nucleic acid sequence selected from the group consisting of:
 - a) SEQ ID NOs 1, 3, 5, 17, 19, 21, 7, 9, 11, 13 and 15 or a combination of these sequences;
 - b) SEQ ID NOs 23, 24 and 25;
 - c) a functional fragment or variant of the sequences in a) or b);
 - d) a complement to the sequences in a), b) or c).
2. An isolated nucleic acid molecule having at least 70% sequence homology to a nucleic acid as claimed in claim 1.
3. An isolated nucleic acid molecule having at least 80% sequence homology to a nucleic acid as claimed in claim 1.
4. An isolated nucleic acid molecule having at least 90% sequence homology to a nucleic acid as claimed in claim 1.
5. An isolated nucleic acid molecule having at least 95% sequence homology to a nucleic acid as claimed in claim 1.
6. An isolated nucleic acid molecule having at least 99% sequence homology to a nucleic acid as claimed in claim 1.
7. An isolated polypeptide having an amino acid sequence selected from the group consisting of:
 - a) SEQ ID NOs 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, and 22 or a combination of these sequences;

- b) A functional fragment or variant of the sequences listed in a).
8. An isolated polypeptide molecule having at least 70% sequence homology to a polypeptide as claimed in claim 7.
 9. An isolated polypeptide molecule having at least 80% sequence homology to a polypeptide as claimed in claim 7.
 10. An isolated polypeptide molecule having at least 90% sequence homology to a polypeptide as claimed in claim 7.
 11. An isolated polypeptide molecule having at least 95% sequence homology to a polypeptide as claimed in claim 7.
 12. An isolated polypeptide molecule having at least 99% sequence homology to a polypeptide as claimed in claim 7.
 13. A primer capable of binding to a nucleic acid molecule as claimed in claim 1.
 14. A primer having a nucleotide sequence selected from the group consisting of SEQ ID NOs 26-51.
 15. A primer having a nucleotide sequence which comprises at least substantially 15-20 contiguous nucleotides of a nucleic acid molecule selected from the group consisting of: SEQ ID NOs. 1, 3, 5, 17, 19, 21, 7, 9, 11, 13 and 15.
 16. A probe capable of binding to a nucleic acid molecule as claimed in claim 1.
 17. The use of a probe capable of binding to a nucleic acid molecule as claimed in claim 1 to identify at least one gene of the lolitrem gene cluster in an endophyte.
 18. An isolated nucleic acid molecule which is able to stringently hybridize to a nucleic acid molecule as claimed in claim 1.

19. An isolated nucleic acid molecule as claimed in claim 18 wherein the molecule is a primer.
20. An isolated nucleic acid molecule as claimed in claim 18 wherein the molecule is a probe.
21. A method for identifying mutations in the lolitrem gene cluster of an endophyte exhibiting useful phenotypic traits, characterized by the steps of:
 - a) identifying at least one gene in the lolitrem gene cluster of an endophyte;
 - b) sequencing the gene(s) identified at a);
 - c) comparing the sequence at b) to SEQ ID NOs 1, 3, 5, 17, 19, 21, 7, 9, 11, 13 and 15 or a combination of these sequences to ascertain any differences in nucleotide sequence.
22. An endophyte in which at least one of the genes in the lolitrem gene cluster has been mutated or otherwise disrupted to manipulate the indole diterpene biosynthetic pathway.
23. The use of a nucleic acid molecule as claimed in claim 1 to produce an indole diterpene, enzyme, intermediate or other chemical compound associated with the indole diterpene biosynthetic pathway.
24. The use of a nucleic acid molecule as claimed in claim 1 to study the indole diterpene pathway.
25. A construct which includes a nucleic acid molecule as claimed in claim 1.
26. A host cell which includes a non-endogenous nucleic acid molecule as claimed in claim 1.

27. An endophyte which includes a non-endogenous nucleic acid molecule as claimed in claim 1.
28. The use of a polypeptide as claimed in claim 7 to catalyze *in vitro* or *in vivo* a reaction involved in the biosynthesis of an indole diterpene.
29. A kit for identifying the lolitrem gene cluster which includes a probe.
30. A kit for identifying the lolitrem gene cluster which includes at least one primer pair.
31. A method of manipulating the indole diterpene biosynthetic pathway characterized by the step of altering a nucleic acid as claimed in claim 1 to produce a gene encoding a non-functional polypeptide.
32. The use of a gene produced by the method of claim 31 to manipulate the indole diterpene biosynthetic pathway.
33. An expression system which includes a non-endogenous nucleic acid molecule as claimed in claim 1.
34. The use of an expression system as claimed in claim 33 to produce indole diterpene, enzyme, intermediate or other chemical compound associated with the indole diterpene biosynthetic pathway.
35. The use of a primer as claimed in any one of claims 13-15 to amplify a nucleic acid molecule.
36. A plant including a cell which includes a non-endogenous nucleic acid molecule as claimed in claim 1.
37. A plant as claimed in claim 36 wherein the plant is a grass.
38. A plant as claimed in claim 37 wherein the plant is a rye grass.

39. A plant as claimed in claim 38 wherein the cell is present as an endophyte.
40. The use of an isolated nucleic acid molecule in the biosynthesis of an indole diterpene.